1060 Atherectomy: New Devices and the Challenge of Total Occlusion

Wednesday, March 19, 1997, Noon–2:00 p.m.
Anaheim Convention Center, Hall E
Presentation Hour: Noon–1:00 p.m.

1060-129 Restenosis Mechanism After Aggressive Directional Coronary Atherectomy Assessed by Intravascular Ultrasound in Adjunctive Balloon Angioplasty Following Coronary Atherectomy Study (ABACAS)

S. Sumitsuji, T. Suzuki, O. Katoh, H. Tamai, T. Aizawa, T. Yamaguchi, H. Kurogane, P.J. Fitzgerald for the ABACAS Investigators. *Osaka Medical Center, Osaka, Japan*

It has been reported that percent plaque area (% PA) after DCA in the Adjunctive Balloon Angioplasty Following Coronary Atherectomy Study (ABACAS) achieved less than 50% with aggressive debulking. The purpose of this study was to evaluate the mechanism of restenosis after aggressive DCA with IVUS-guidance. We examined 94 lesions (44.3% in 212 eligible cases) in which IVUS was observed at preDCA, postDCA and follow-up. Follow-up IVUS study was performed at a mean of 190 days after DCA. Changes in vessel area (VA), plaque area (PA) and % PA were measured and compared in restenosed and non-restenosed group (restenosis: % DS > = 50% at follow-up in QCA).

Results: Binary restenosis ratio at 6 months in this cohort was 13.8% (13/94).

	preDCA	postDCA	Follow-up
Restenosed (n = 13)			
VA (mm^2)	16.0 ± 4.2	16.3 ± 4.8	15.6 ± 3.9 (p = n.s)
PA (mm^2)	13.5 ± 4.3	8.5 ± 3.7	13.5 ± 3.7 (p < 0.001)
% PA (%)	82.7 ± 8.8	51.0 ± 14.2	84.9 ± 9.1
Non-Restenosed (n = 81)			
VA (mm^2)	15.1 ± 4.7	16.7 ± 4.7	15.9 ± 4.0 (p = n.s)
PA (mm^2)	11.7 ± 4.2	7.3. ± 3.2	9.6 ± 3.7 (p < 0.0001)
% PA (%)	77.1 ± 8.4	43.0 ± 11.0	60.7 ± 13.6

In restenosed lesion group, 88% of late lumen loss was due to the increase of PA (5.0 mm^2) and 12% was due to the decrease of VA (0.7 mm^2).

Conclusion: The major mechanism of restenosis after aggressive DCA was the increase of plaque area.

1060-130 A Comparative Analysis of Clinical Outcomes in 2268 Patients Undergoing "Optimal" Directional Atherectomy or "Optimal" Stenting

R. Mehran, J.J. Popma, G.S. Mintz, M.K. Hong, J.R. Laird, L.F. Satler, K.M. Kent, A.D. Pichard, T.A. Bucher, B. Kleiber, S. Yeung, M.B. Leon. *Washington Hospital Center, Washington, DC, USA*

Although "optimal" (< 20% residual stenosis) directional coronary atherectomy (DCA) (e.g., BOAT) and coronary stents (e.g., STRESS I + II) have been shown to improve late clinical outcome compared with balloon PTCA in *de novo* native lesions, the comparative benefit of these methods on late (1 year) clinical recurrence has not been determined. To address this issue, we reviewed the late outcome of 2268 patients undergoing native vessel "optimal" revascularization (< 20% visual stenosis) of 2353 lesions using DCA (N = 803) or stenting (N = 1550). Target lesion revascularization (TLR) (rePTCA; CABG) within 1 year after intervention was required in 20.7% lesions (25.3% in DCA vs. 18.3% in stent; p < 0.001). To assess the independent effect of the device on the occurrence of late TLR in patients with optimal revascularization, we then performed a multivariable analysis of 796 patients with a quantitative angiography (QCA) final % stenosis < 20%. Controlling for other predictors of clinical restenosis (Table), final % diameter stenosis and the device used (DCA versus stents) were not predictive of late clinical recurrence.

Predictors of TLR	Chi-Square	Odds Ratio	p Value
Diabetes Mellitus	21.14	2.335	< 0.0001
Final Reference Diameter	10.62	0.547	0.0011
Prior PTCA	8.006	1.625	0.0047
Lesion Length, in mms	4.692	1.039	0.0303
LAD Location	3.197	–	0.0738

We conclude that in patients undergoing "optimal" revascularization using DCA or stenting: 1) 1-year target lesion revascularization is favorable (21%), and 2) differences in baseline clinical and angiographic factors account for differences in late revascularization.

1060-131 Clinical and Angiographic Outcome of Directional Coronary Atherectomy (DCA) and Palmaz-Schatz Stent Implantation for Ostial Left Anterior Descending (LAD) Coronary Lesions

T. Kimura, Y. Sawada, E. Shinoda, T. Tamura, H. Yokoi, Y. Nakagawa, N. Hamasaki, H. Nosaka, M. Nobuyoshi. *Kokura Memorial Hospital, Kitakyushu, Japan*

To evaluate efficacy and safety of DCA and stenting for ostial LAD lesions, single center experience was analyzed. Ostial LAD lesions were defined as those involving the ostium with their most severe narrowing located within 5 mm from the ostium. Measurement of lumen diameter (LD) was made by a caliper at minimal and reference LAD, ostial circumflex (Cx), and distal left main (LM). DCA was performed in 75 patients and stenting in 66 patients. Stent group had more adverse baseline characteristics (DCA/Stent: age (yrs) 63 ± 10/66 ± 9; P = 0.05, multivessel disease (%) 33/49; P = 0.07, diabetes (%) 13/29; P = 0.02, restenotic lesions (%) 31/53; P = 0.007, total occlusion (%) 1.3/11; P = 0.02, calcification (%) 16/38; P = 0.003, lesion length (mm) 8.9 ± 4.6/11.2 ± 7.5; P = 0.03, reference LD (mm) 3.09 ± 0.47/2.88 ± 0.57; P = 0.02).

Procedure Success	Restenosis	TLR	CABG	
DCA (N = 75)	97%	24%	19%	4%
Stent (N = 66)	96%	31%	23%	6%
Minimal LD (mm)	pre	post	6 mos	
DCA (N = 66)		0.89 ± 0.33	2.56 ± 0.43	1.98 ± 0.75
Stent (N = 58)		0.69 ± 0.4*	2.67 ± 0.41	1.7 ± 0.77*
Ostial Cx LD (mm)	pre	post	6 mos	
DCA		2.56 ± 0.67	2.52 ± 0.7	2.5 ± 0.61
Stent		2.45 ± 0.78	2.18 ± 0.77*	1.9 ± 0.76*

TLR = target lesion revascularization, *P < 0.05 versus DCA

Despite more adverse baseline characteristics, stenting resulted in acceptable long-term outcome. However, worsening of ostial Cx stenosis was more frequently seen after stenting. DCA remains having a niche in the treatment of ostial LAD lesions.

1060-132 Is Bigger Really Better? – Associations between Excised Plaque Mass and Chronic Restenosis after Coronary Atherectomy

T.M. Schiele, M.P. Heintzen, C.J. Michel, E.G. Vester, B.E. Strauer. *Dpt. of Cardiology, Heinrich-Heine-University, Düsseldorf, Germany*

Mechanisms of Directional Coronary Atherectomy (DCA) comprise plaque ablation and vessel strain or stretching. Despite the greater extent of immediate lumen gain DCA has not been found to yield significantly better late angiographic results when compared with balloon angioplasty. Excessive dottering of the vessel without adequate plaque removal could be a possible explanation for this phenomenon. We therefore investigated prospectively 79 patients who underwent DCA yielding a maximal 20% residual diameter stenosis, whether an association or correlation between achieved plaque mass and long term angiographic follow-up results existed. Biplane quantitative coronary angiography was performed off-line by two independent experienced cardiologists using a cine-video-converter, a frame-grabber and an automated edge-detection system. Excised plaque specimens were weighed by a precision-balance. Actual weights were related to calculated theoretical plaque weights. Patients who had undergone combined interventional procedures, had showed occlusions, had had status post CABG, unstable angina or had suffered a myocadrial infarction were excluded. Mean diameter stenosis pre DCA was 65.5 ± 10.5%, post DCA 11.7 ± 6.7%. Cumulative restenosis rate was 19.5%. On follow-up (6 months) mean diameter stenosis measured 46.2 ± 24.8%. Mean actual plaque weight was 21.7 ± 14.4 mg. The relation between actual and calculated plaque weight revealed a statistically significant inverse correlation with diameter stenosis on follow-up (r = −0.7416; p = 0.014). Actually excised plaque mass might serve as an significant predictive factor for chronic restenosis after DCA emphasizing the relevance of achieving an optimal primary result by plaque ablation rather than by vessel extension.